

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



10/536680



(43) International Publication Date
17 June 2004 (17.06.2004)

PCT

(10) International Publication Number
WO 2004/050671 A1

- (51) International Patent Classification⁷: C07G 17/00, C07C 323/12, C10M 135/26
- (74) Common Representative: CIBA SPECIALTY CHEMICALS HOLDING INC.; Patent Department, Klybeckstrasse 141, CH-4057 Basel (CH).
- (21) International Application Number: PCT/EP2003/050876
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 24 November 2003 (24.11.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/430,228 2 December 2002 (02.12.2002) US
- (84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (*for all designated States except US*): CIBA SPECIALTY CHEMICALS HOLDING INC. [CH/CH]; Klybeckstrasse 141, CH-4057 Basel (CH).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): CAMENZIND, Hugo [CH/CH]; Allmendstrasse 15, CH-3014 Bern (CH). DUBS, Paul [CH/CH]; Bergackerstrasse 21, CH-6330 Cham (CH). MARTIN, Roger [CH/CH]; Alte Saline 16, CH-4310 Rheinfelden (CH). CHASAN, David, Eliezer [US/US]; 1100 Windsor Road, Teaneck, NJ 07666 (US). DEMME, Gunnar [US/US]; 33 Senior Avenue, Mahopac, NY 10541 (US). ROBBINS, James [US/US]; 609 Charles V. Street, Satsuma, AL 36572 (US).
- Published:
- with international search report
 - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: LIQUID PHENOLIC SULPHUR-CONTAINING ANTIOXIDANTS

(57) Abstract: The invention relates to liquid sulphur-containing antioxidants and to compositions comprising them. The novel lubricant comprise the reaction product of a selected group of 5-tert-butyl-4-hydroxy-3-methyl(or tert-butyl)phenyl substituted carboxylic acid esters with thiodiethylene glycol and a mono-hydroxy alcohol with a carbon chain length higher than 4 C-atoms. The novel lubricant compositions are highly resistant to oxidative degradation and are capable of reducing the negative effects of deposits, such as black sludge, in motor combustion engines, particularly spark ignition internal combustion engines.

WO 2004/050671 A1